NASA
National Aeronautics and Space Administration

MAY 17, 1990

NRA-90-OSSA-14

Research Announcement

INFRARED, SUBMILLIMETER, AND RADIO ASTRONOMY RESEARCH AND ANALYSIS PROGRAM

CATEGORY A: DETECTOR AND INSTRUMENT TECHNOLOGY DEVELOPMENT, AND BALLOON, AND GROUND-BASED OBSERVATIONS

Proposals Due: July 17, 1990

OMB Approval No. 2700-0042

INFRARED, SUBMILLIMETER, AND RADIO ASTRONOMY RESEARCH AND ANALYSIS PROGRAM

NASA Research Announcement
Soliciting Proposals
for the
Infrared, Submillimeter, and Radio Astronomy
Research and Analysis Program
for the Period
Fiscal Year 1991 to Fiscal Year 1993

NRA 90-OSSA-14
Issued: May 17, 1990
Proposals due: July 17, 1990

Office of Space Science and Applications
National Aeronautics and Space Administration
Washington, DC 20546

NASA RESEARCH ANNOUNCEMENT

INFRARED, SUBMILLIMETER, AND RADIO ASTRONOMY RESEARCH AND ANALYSIS PROGRAM

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THE INFRARED, SUBMILLIMETER, AND RADIO ASTRONOMY RESEARCH AND ANALYSIS PROGRAM

This NASA Research Announcement (NRA) solicits basic research proposals to conduct investigations which are relevant to NASA's program in Infrared, Submillimeter, and Radio (ISR) Astronomy. The primary goals of the ISR Astronomy program are to obtain a better understanding of the evolution and origins of astronomical objects, from stars and planets to galaxies and quasars and the large-scale structure of the universe, as revealed through their long wavelength radiation characteristics, and to develop and demonstrate advanced sensor and instrument technologies. The range of wavelengths covered by the ISR Astronomy program spans the three decades from the near infrared (1 micron) to one millimeter, in those areas of direct interest to NASA's space program, and also extends several decades into the radio spectrum. The purpose of the ISR Research and Analysis (R&A) program is to provide research and technology development in support of ongoing and future ISR Astronomy flight programs. This NRA specifically encompasses support in the areas of detector and technology development, balloon or sounding rocket science investigations, and ground-based astronomical observations in the range of wavelengths covered by the ISR Astronomy program. Support of ground-based astronomical observations will only be considered if:

a) such observations are in direct support of an ongoing NASA flight program (e.g., calibration) and/or,

b) the proposers are ineligible by virtue of their institutional affiliation to receive support from the National Science Foundation.

ISR Astronomy research efforts in areas of theory, data analysis, and laboratory astrophysics will be covered under another NASA NRA. Use of the C-141 Kuiper Airborne Observatory is covered separately and is also excluded from this NRA solicitation. NASA's ISR Astronomy flight programs presently encompass payloads flown on free-flying spacecraft, high altitude balloons, sounding rockets, and airborne observatories. The ISR Astronomy Research and Analysis areas covered by this NRA solicitation provide support for basic research relevant to the design and development of instrumental concepts for future NASA missions, the conduct of scientific investigations via exposure of instrumentation carried on high altitude balloons and sounding

rockets, and the conduct of ground-based astronomical observations that complement the flight program observations. It is presently expected these ISR Astronomy R&A areas will be funded at an annual level of about $2 million.

Participation in this program is open to all categories of organizations, including educational institutions and other nonprofit organizations, corporations, NASA Centers, and other Government agencies. Any foreign participation will be on a no-exchange of funds basis. Proposals may be submitted at any time during the period ending July 17, 1990, and will be evaluated by a scientific peer review panel during August 1990.

Further details relevant to the Infrared, Submillimeter, and Radio Astronomy R&A program are included in the enclosed appendices. Appendix A provides specific information relevant to this program. Detailed information relevant to the goals of NASA's ISR Program during the next 10 years is provided in the most recent report of NASA's ISR Management and Operations Working Group (ISR-MOWG) (see Appendix A, Section III). This report is available upon request, and will automatically be forwarded to all those submitting Letters of Intent to propose in response to this NRA. Appendix B contains the basic guidance needed for preparation of solicited proposals in response to an NRA. Appendix C provides information relevant to the cost section of proposals. Cost proposals are not required to conform exactly to this format; however, information supplied at this level of detail will be very helpful in assuring the expeditious processing of the grant procurements for selected proposals. Appendix D provides additional information on the submission of proposals and their evaluation, selection, and implementation that augments the information contained in Appendix B. The information in Appendix D is applicable to this NRA only. Appendix E is a request for information to update the NASA Office of Space Science and Applications mailing list.

IDENTIFIER:	NRA 90-OSSA-14
SUBMIT LETTERS OF INTENT TO PROPOSE TO:	Dr. Lawrence Caroff Astrophysics Division Code SZF National Aeronautics and Space Administration Washington, DC 20546
SUBMIT LETTERS OF INTENT BY:	May 31, 1990
SUBMIT PROPOSALS TO:	Infrared, Submillimeter, and Radio Astronomy R&A Program Code SZF-10 National Aeronautics and Space Administration Washington, DC 20546
SUBMIT PROPOSALS BY:	July 17, 1990
NUMBER REQUIRED:	20 copies
SELECTING OFFICIAL:	Director, Astrophysics Division Office of Space Science and Applications
ADDITIONAL INFORMATION CAN BE OBTAINED FROM:	Dr. Lawrence Caroff Astrophysics Division Code SZF National Aeronautics and Space Administration Washington, DC 20546 (202) 453-1455

Your interest and cooperation in participating in this effort are appreciated.

L. A. Fisk
Associate Administrator for
Space Science and Applications

Enclosures

THE INFRARED, SUBMILLIMETER, AND RADIO ASTRONOMY RESEARCH AND ANALYSIS PROGRAM

I. SCOPE

This program is intended to provide basic research and technology development in support of the NASA Infrared, Submillimeter, and Radio (ISR) Astronomy flight programs. It should be noted that, in addition to the basic scientific and technical merit of the proposed research, its relevance to the ISR Astronomy flight programs, both existing and planned, will be a significant factor in the proposed evaluation. A summary of the scientific goals of the ISR Astronomy program is provided in Section III. This NRA solicits proposals in support of scientific investigations of cosmic phenomena via observations of their radiation in the infrared and submillimeter (1 - 1000 micron) and radio wavelength spectral regimes. These investigations are expected to involve the design, development, and testing of detector and/or instrument concepts and/or the use of such instrumentation on high altitude balloons or sounding rockets. Investigations which primarily involve theoretical studies, the analysis of data from past missions, laboratory astrophysics research, or developments and observations that fall within the Airborne Astronomy Observation Program **are not** solicited by this Announcement. In addition, support of ground-based astronomical observations will be considered only if:

a) such observations are in direct support of an ongoing NASA flight program (e.g., calibration) and/or,

b) the proposers are ineligible by virtue of their institutional affiliation to receive support from the NSF.

Priority will be given to proposed work that has overall scientific and technical merit and which is shown to be of direct relevance to ongoing or planned NASA Flight Programs such as: Cosmic Background Explorer (COBE), Space Infrared Telescope Facility (SIRTF), Stratospheric Observatory for Infrared Astronomy (SOFIA), Kuiper Airborne Observatory (KAO), Submillimeter Moderate Mission (SMMM), and Large Deployable Reflector (LDR).

The total funding available for the R&A program elements encompassed by this solicitation is presently expected to be approximately $2 million in FY 1991 with modest increases for inflation over the following two years. There are no restrictions on the level of funding which may be requested for an investigation under this program. During the current year, 25 groups are being supported at a total level of about $2 million.

II. PROGRAM DURATION AND PROPOSAL SCHEDULE

The Infrared, Submillimeter, and Radio Astronomy R&A Program is a continuing program. Current plans call for a new issuance of a NASA Research Announcement soliciting proposals for participation in theoretical studies, analysis of data from past missions, and laboratory astrophysics (Category B) in the spring of 1991, and approximately every three years thereafter. Likewise, it is planned to issue a new NASA Research Announcement for soliciting the program described herein (Category A) approximately every three years. Proposers are encouraged to define a program which may be accomplished in a three-year period. It is recognized the proposed investigation may evolve with time. Accordingly, emphasis should be placed upon the first year's effort with as much detail as possible provided relevant to the planned second- and third-year's activities. Similarly, a detailed budget corresponding to the first-year program is required, together with as reliable an estimate as feasible of the projected budget for the succeeding years. It should be recognized NASA can only commit financial support on a one-year basis. Proposals for investigations requiring less than a three-year time scale to complete are also acceptable, as are those which require a longer time scale to complete. In the latter case, the key projected activities beyond the initial three-year period of the proposed effort should be identified. Although unsolicited proposals relevant to NASA's ISR Astronomy R&A Program may be submitted at any time, such proposals will be treated and considered as if submitted in response to this NRA. Unsolicited proposals received that fall within the scope of an open NRA will be reviewed and evaluated at the same time and with any proposals received in response to that NRA. The next review of the ISR Astronomy R&A Program is planned for August 1990. Proposals received by July 17, 1990, will be included in that review. Unsolicited proposals received in the interim after the August 1990 review and the issuance of a subsequent solicitation (anticipated to occur at three-year intervals) will be considered on a case-by-case basis in the context of the available funding at that time.

To facilitate planning for the peer review process, individuals who intend to submit proposals in response to this solicitation should submit a Letter of Intent by May 31, 1990, (see Appendix D, Section I.A, "Letter of Intent," for more details).

III. THE INFRARED AND RADIO ASTROPHYSICS FLIGHT PROGRAM

The Infrared and Radio Astrophysics Branch administers a growing program of space-based missions and suborbital investigations in the areas of infrared, submillimeter, and radio astronomy. The ISR Astronomy program is directed toward investigations of astrophysical objects and phenomena as revealed by their radiation characteristics over the wavelength range 1 μm (1 micron) to 1000 μm (1 millimeter) and extending decades more into the radio wavelengths from 1 cm to > 10 m. Wavelengths longer than one micron hold the key to the origins of all the major structures in the universe, revealing the formation of solar systems and stars, probing the complex chemistry of the interstellar matter that leads eventually to life itself, uncovering the genesis of normal and active galaxies as well as of quasars, and mapping the overall distribution of matter in the universe following the Big Bang. Two inescapable facts account for much of the importance of infrared and submillimeter astrophysics: first, the Hubble expansion inexorably makes the infrared the premier spectral band for the study of the large scale structure of the early universe; second, the absorption of optical and ultraviolet radiation by interstellar dust, and the reradiation of that energy by warm dust at long wavelengths, make infrared observations essential to uncovering the physical processes that govern the formation of stars and planets in the visually obscured cores of molecular clouds, and produce the enormous luminosities seen in the centers of active galaxies. To answer the fundamental questions of evolution and origin, different space observatories that emphasize various combinations of high sensitivity, high spatial resolution, and high spectral resolution throughout the broad wavelength range are required. A compilation of relevant NASA flight programs and collaborative international programs in the discipline of Infrared, Submillimeter, and Radio Astronomy is provided in Table 1, and typical research areas presently supported under the ISR Astronomy R&A program are listed in Table 2.

A detailed summary of the near-term goals of NASA's Infrared, Submillimeter, and Radio Astronomy Program is provided in the most recent (March 1989) report of NASA's ISR Management and Operations Working Group (ISR-MOWG). This report provides a blueprint for NASA's objectives in this research area over the next decade and should be

consulted to assess the potential relevance of your proposed investigation. Copies of the report are available upon request and will be automatically forwarded to those submitting Letters of Intent.

IV. PROGRAM MANAGEMENT INFORMATION

NASA's Infrared, Submillimeter, and Radio Astronomy Research and Analysis Program is managed by the Infrared and Radio Astrophysics Branch, Astrophysics Division, Code SZ, National Aeronautics and Space Administration, Washington, DC 20546. Questions regarding proposal format, evaluation procedures, or requests for further general information concerning the ISR program should be referred to Dr. Lawrence Caroff, Acting Chief, Infrared and Radio Astrophysics Branch (Code SZF) (202-453-1455).

NRA APPENDIX B

GUIDELINES FOR RESPONDING TO

NASA RESEARCH ANNOUNCEMENTS (NRA)

FOR SOLICITED BASIC RESEARCH PROPOSALS

AUGUST 1988

OFFICE OF PROCUREMENT
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
WASHINGTON, DC 20546

INSTRUCTIONS FOR RESPONDING TO NASA RESEARCH ANNOUNCEMENTS FOR SOLICITED RESEARCH PROPOSALS

(AUGUST 1988)

1. FOREWORD

a. NASA depends upon industry, educational institutions and other nonprofit organizations for most of its research efforts. While a number of mechanisms have been developed over the years to inform the research community of those areas in which NASA has special research interests, these instructions apply only to "NASA Research Announcements," a form of "broad agency announcement" described in 6.102(d)(2) and 35.016 of the Federal Acquisition Regulation (FAR). The "NASA Research Announcement (NRA)" permits competitive selection of research projects in accordance with statute while at the same time preserving the traditional concepts and understandings associated with NASA sponsorship of research.

b. These instructions are Appendix I to 18-70.203 of the NASA Federal Acquisition Regulation Supplement.

2. POLICY

a. NASA fosters and encourages the submission of research proposals relevant to agency mission requirements by solicitations, "NASA Research Announcements," which describe research areas of interest to NASA. Proposals received in response to an NRA will be used only for evaluation purposes.

b. NASA does not allow a proposal, the contents of which are not available without restriction from another source, or any unique ideas submitted in response to an NRA to be used as the basis of a solicitation or in negotiation with other organizations, nor is a pre-award synopsis published for individual proposals.

c. A solicited proposal that results in a NASA award becomes part of the record of that transaction and may be available to the public on specific request; however, information or material that NASA and the awardee mutually agree to be of a privileged nature will be held in confidence to the extent permitted by law, including the Freedom of Information Act.

3. PURPOSE

These instructions are intended to supplement documents identified as "NASA Research Announcements." The NRAs contain programmatic information and certain "NRA-specific" requirements which apply only to proposals prepared in response to that particular announcement. These instructions contain the general proposal preparation information which applies to responses to all NRAs.

4. RELATIONSHIP TO AWARD

a. A contract, grant, cooperative agreement, or other agreement may be used to accomplish an effort funded on the basis of a proposal submitted in response to an NRA. NASA does not have separate "grant proposal" and "contract proposal" categories, so all proposals may be prepared in a similar fashion. NASA will determine the appropriate instrument.

b. Grants are generally used to fund basic research in educational and nonprofit institutions, while research in other private sector organizations is accomplished under contract. Additional information peculiar to the contractual process (certifications, cost and pricing data, facilities information, etc.) will be requested, as necessary, as the

procurement progresses. Contracts resulting from NRAs are subject to the Federal Acquisition Regulation and the NASA FAR Supplement (NHB 5100.4). Any resultant grants or cooperative agreements will be awarded and administered in accordance with the NASA Grant and Cooperative Agreement Handbook (NHB 5800.1).

5. CONFORMANCE TO GUIDANCE

a. NASA does not have any mandatory forms or formats for preparation of responses to NRAs; however, it is requested that proposals conform to the procedural and submission guidelines covered in these instructions. In particular, NASA may accept proposals without discussion; hence, proposals should initially be as complete as possible and be submitted on the proposers' most favorable terms.

b. In order to be considered responsive to the solicitation, a submission must, at a minimum, present a specific project within the areas delineated by the NRA; contain sufficient technical and cost information to permit a meaningful evaluation; be signed by an official authorized to legally bind the submitting organization; not merely offer to perform standard services or to just provide computer facilities or services; and not significantly duplicate a more specific current or pending NASA solicitation. NASA reserves the right to reject any or all proposals received in response to an NRA when such action is considered in the best interest of the Government.

6. NRA-SPECIFIC ITEMS

a. Several proposal submission items will appear in the NRA itself. These include: the unique NRA identifier; when to submit proposals; where to send proposals; number of copies required; and sources for more information.

b. Items included in these instructions may be supplemented by the NRA, as circumstances warrant. Examples are: technical points for special emphasis; additional evaluation factors; and proposal length.

7. PROPOSAL CONTENTS

a. The following general information is needed in all proposals in order to permit consideration in an objective manner. NRAs will generally specify topics for which additional information or greater detail is desirable. Each proposal copy shall contain all submitted material, including a copy of the transmittal letter if it contains substantive information.

b. **Transmittal Letter or Prefatory Material**

(1) The legal name and address of the organization and specific division or campus identification if part of a larger organization;

(2) A brief, scientifically valid project title intelligible to a scientifically literate reader and suitable for use in the public press;

(3) Type of organization: e.g., profit, nonprofit, educational, small business, minority, women-owned, etc.;

(4) Name and telephone number of the principal investigator and business personnel who may be contacted during evaluation or negotiation;

(5) Identification of any other organizations that are currently evaluating a proposal for the same efforts;

(6) Identification of the specific NRA, by number and title, to which the proposal is responding;

(7) Dollar amount requested of NASA, desired starting date, and duration of project;

(8) Date of submission; and

(9) Signature of a responsible official or authorized representative of the organization, or any other person authorized to legally bind the organization (unless the signature appears on the proposal itself).

c. **Restriction on Use and Disclosure of Proposal Information**

It is NASA policy to use information contained in proposals for evaluation purposes only. While this policy does not require that the proposal bear a restrictive notice, offerors or quoters should, in order to maximize protection of trade secrets or other information that is commercial or financial and confidential or privileged, place the following notice on the title page of the proposal and specify the information subject to the notice by inserting appropriate identification, such as page numbers, in the notice. In any event, information (data) contained in proposals will be protected to the extent permitted by law, but NASA assumes no liability for use and disclosure of information not made subject to the notice.

NOTICE

Restriction on Use and Disclosure of Proposal Information

The information (data) contained in [insert page numbers or other identification] of this proposal constitutes a trade secret and/or information that is commercial or financial and confidential or privileged. It is furnished to the Government in confidence with the understanding that it will not, without permission of the offeror, be used or disclosed other than for evaluation purposes; provided, however, that in the event a contract (or other agreement) is awarded on the basis of this proposal the Government shall have the right to use and disclose this information (data) to the extent provided in the contract (or other agreement). This restriction does not limit the Government's right to use or disclose this information (data) if obtained from another source without restriction.

d. **Abstract**

Include a concise (200-300 word if not otherwise specified in the NRA) abstract describing the objective of the proposed effort and the method of approach.

e. **Project Description**

(1) The main body of the proposal shall be a detailed statement of the work to be undertaken and should include objectives and expected significance; relation to the present state of knowledge in the field; and relation to previous work done on the project and to related work in progress elsewhere. The statement should outline the general plan of work, including the broad design of experiments to be undertaken and an adequate description of experimental methods and procedures. The project description should be prepared in a manner that addresses the evaluation factors in these instructions and any additional specific factors in the NRA. Any substantial collaboration with individuals not referred to in the budget or use of consultants should be described. Note, however, that

subcontracting significant portions of a research project is discouraged.

(2) When it is expected that the effort will require more than one year for completion, the proposal should cover the complete project to the extent that it can be reasonably anticipated. Principal emphasis should, of course, be on the first year of work, and the description should distinguish clearly between the first year's work and work planned for subsequent years.

f. **Management Approach**

For large or complex efforts involving interactions among numerous individuals or other organizations, plans for distribution of responsibilities and any necessary arrangements for ensuring a coordinated effort should be described. Aspects of any required intensive working relations with NASA field centers that are not logical inclusions elsewhere in the proposal should be described in this section.

g. **Personnel**

The principal investigator is responsible for direct supervision of the work and participates in the conduct of the research regardless of whether or not compensation is received under the award. A short biographical sketch of the principal investigator, a list of principal publications and any exceptional qualifications should be included. Omit social security number and other personal items which do not merit consideration in evaluation of the proposal. Give similar biographical information on other senior professional personnel who will be directly associated with the project. Give the names and titles of any other scientists and technical personnel associated substantially with the project in an advisory capacity. Universities should list the approximate number of students or other assistants, together with information as to their level of academic attainment. Any special industry-university cooperative arrangements should be described.

h. **Facilities and Equipment**

(1) Describe available facilities and major items of equipment especially adapted or suited to the proposed project, and any additional major equipment that will be required. Identify any Government-owned facilities, industrial plant equipment, or special tooling that are proposed for use on the project.

(2) Before requesting a major item of capital equipment, the proposer should determine if sharing or loan of equipment already within the organization is a feasible alternative to purchase. Where such arrangements cannot be made, the proposal should so state. The need for items that typically can be used for both research and non-research purposes should be explained.

i. **Proposed Costs**

(1) Proposals should contain cost and technical parts in one volume: do not use separate "confidential" salary pages. As applicable, include separate cost estimates for salaries and wages; fringe benefits; equipment; expendable materials and supplies; services; domestic and foreign travel; ADP expenses; publication or page charges; consultants; subcontracts; other miscellaneous identifiable direct costs; and indirect costs. List salaries and wages in appropriate organizational categories (e.g., principal investigator, other scientific and engineering professionals, graduate students, research assistants, and technicians and other non-professional personnel).

Estimate all manpower data in terms of man-months or fractions of full-time.

(2) Explanatory notes should accompany the cost proposal to provide identification and estimated cost of major capital equipment items to be acquired; purpose and estimated number and lengths of trips planned; basis for indirect cost computation (including date of most recent negotiation and cognizant agency); and clarification of other items in the cost proposal that are not self-evident. List estimated expenses as yearly requirements by major work phases. (Standard Form 1411 may be used).

(3) Allowable costs are governed by FAR Part 31 and the NASA FAR Supplement Part 18-31 (and OMB Circulars A-21 for educational institutions and A-122 for nonprofit organizations).

j. **Security**

Proposals should not contain security classified material. However, if the proposed research requires access to or may generate security classified information, the submitter will be required to comply with applicable Government security regulations.

k. **Current Support**

For other current projects being conducted by the principal investigator, provide title of project, sponsoring agency, and ending date.

l. **Special Matters**

(1) Include any required statements of environmental impact of the research, human subject or animal care provisions, conflict of interest, or on such other topics as may be required by the nature of the effort and current statutes, executive orders, or other current Government-wide guidelines.

(2) Proposers should include a brief description of the organization, its facilities, and previous work experience in the field of the proposal. Identify the cognizant Government audit agency, inspection agency, and administrative contracting officer, when applicable.

8. RENEWAL PROPOSALS

a. Renewal proposals for existing awards will be considered in the same manner as proposals for new endeavors. It is not necessary that a renewal proposal repeat all of the information that was in the original proposal upon which the current support was based. The renewal proposal should refer to its predecessor, update the parts that are no longer current, and indicate what elements of the research are expected to be covered during the period for which extended support is desired. A description of any significant findings since the most recent progress report should be included. The renewal proposal should treat, in reasonable detail, the plans for the next period, contain a cost estimate, and otherwise adhere to these instructions.

b. NASA reserves the right to renew an effort either through amendment of an existing contract or by a new award.

9. LENGTH

Unless otherwise specified in the NRA, every effort should be made to keep proposals as brief as possible, concentrating on substantive material essential for a complete understanding of the project. Experience shows that few proposals need exceed 15-20 pages. Any necessary detailed information, such as reprints, should be included as attachments rather than in the main body of the proposal. A complete set of attachments is necessary for each copy of the proposal. As proposals are not

returned, avoid use of "one-of-a-kind" attachments: their availability may be mentioned in the proposal.

10. JOINT PROPOSALS

a. Some projects involve joint efforts among individuals in different organizations or mutual efforts of more than one organization. Where multiple organizations are involved, the proposal may be submitted by only one of them. In this event, it should clearly describe the role to be played by the other organizations and indicate the legal and managerial arrangements contemplated. In other instances, simultaneous submission of related proposals from each organization might be appropriate, in which case parallel awards would be made.

b. Where a project of a cooperative nature with NASA is contemplated, the proposal should describe the contributions expected from any participating NASA investigator and agency facilities or equipment which may be required. However, the proposal must be confined only to that which the proposing organization can commit itself. "Joint" proposals which purport to specify the internal arrangements NASA will actually make are not acceptable as a means of establishing an agency commitment.

11. LATE PROPOSALS

A proposal or modification thereto received after the date or dates specified in an NRA may still be considered if the selecting official deems it to offer NASA a significant technical advantage or cost reduction.

12. WITHDRAWAL

Proposals may be withdrawn by the proposer at any time. Offerors are requested to notify NASA if the proposal is funded by another organization or of other changed circumstances which dictate termination of evaluation.

13. EVALUATION FACTORS

a. Unless otherwise specified in the NRA, the principal elements (of approximately equal weight) considered in evaluating a proposal are its relevance to NASA's objectives, intrinsic merit, and cost.

b. Evaluation of a proposal's relevance to NASA's objectives includes the consideration of the potential contribution of the effort to NASA's mission.

c. Evaluation of its intrinsic merit includes the consideration of the following factors, none of which is more important than any other:

(1) Overall scientific or technical merit of the proposal or unique and innovative methods, approaches, or concepts demonstrated by the proposal.

(2) The offeror's capabilities, related experience, facilities, techniques, or unique combinations of these which are integral factors for achieving the proposal objectives.

(3) The qualifications, capabilities, and experience of the proposed principal investigator, team leader, or key personnel who are critical in achieving the proposal objectives.

(4) Overall standing among similar proposals available for evaluation and/or evaluation against the known state-of-the-art.

d. Evaluation of the cost of a proposed effort includes the consideration of the realism and reasonableness of the proposed cost and the relationship of the proposed cost to available funds.

14. EVALUATION TECHNIQUES

Selection decisions will be made following peer and/or scientific review of the proposals. Several evaluation techniques are regularly used within NASA. In all cases, however, proposals are subject to scientific review by discipline specialists in the area of the proposal. Some proposals are reviewed entirely in-house where NASA has particular competence; others are evaluated by a combination of in-house people and selected external reviewers, while yet others are subject to the full external peer review technique (with due regard for conflict-of-interest and protection of proposal information), such as by mail or through assembled panels. Regardless of the technique, the final decisions are always made by a designated NASA selecting official. A proposal which is scientifically and programmatically meritorious, but which is not selected for award during its initial review under the NRA may be included in subsequent reviews unless the proposer requests otherwise.

15. SELECTION FOR AWARD

a. When a proposal is not selected for award, and the proposer has indicated that the proposal is not to be held over for subsequent reviews, the proposer will be notified that the proposal was not selected for award. NASA will notify the proposer and explain generally why the proposal was not selected. Proposers desiring additional information may contact the selecting official who will arrange a debriefing.

b. When a proposal is selected for award, negotiation and award will be handled by the procurement office in the funding installation. The proposal is used as the basis for negotiation with the submitter. Formal RFPs are not used to obtain additional information on a proposal selected under the NRA process. However, the contracting officer may request certain business data and may forward a model contract and other information which will be of use during the contract negotiation.

16. CANCELLATION OF NRA

NASA reserves the right to make no awards under this NRA and, in the absence of program funding or for any other reason, to cancel this NRA by having a notice published in the Commerce Business Daily. NASA assumes no liability for cancelling the NRA or for anyone's failure to receive actual notice of cancellation. Cancellation may be followed by issuance and synopsis of a revised NRA, since amendment of an NRA is normally not permitted.

GUIDELINES FOR PREPARATION OF PROPOSAL COST SUMMARIES

I. PROPOSAL COSTING DETAIL

Sufficient proposal cost detail and supporting information will facilitate a timely evaluation and award for selected proposals. Dollar amounts proposed with no explanation (e.g., Equipment: $58,000 or Labor: $110,000) may cause delays in proposal evaluation and grant award.

The proposed costing information should be sufficiently detailed to allow the Government to identify costed elements for evaluation purposes. Generally, the Government will evaluate costs as to reasonableness, allowability, and allocability. Each budget category should be explained. Offerors should exercise prudent judgment regarding the amount of detail necessary depending upon the complexity of the proposal. Where applicable, the cost section should include a breakdown by year and a total for all periods. While it is not mandatory that cost proposals conform exactly to these guidelines, information supplied at the level of detail shown in Section II will expedite the processing of the grant procurements for selected proposals.

II. EXAMPLES

The number and nature of the appropriate cost categories will vary with the particular plan for each proposed investigation. Examples of the level of detail requested for typical categories are provided below.

A. Direct Labor

Labor costs should be segregated by titles or disciplines with estimated hours and rates for each. Estimates should include a basis of estimate such as currently paid rates or outstanding offers to prospective employees. This format allows the Government to assess cost reasonableness by various means including comparison to similar skills at other organizations. Example:

	Hours	Rate	Amount
Principal Investigator	1,295	$19.34	$25,045
Assistant Investigator	330	$11.78	$ 3,887
Clerical Support	125	$ 8.70	$ 1,088
Total	1,750		$30,020

B. Travel Costs

Costs in this category should be provided as shown in the following example:

trips	destination	duration	air fare	per diem	total
1	Australia	6 days	$1,234	$550	$1,784
2	New Zealand	4 days	$1,456	$366	$3,644
Total					$5,428

C. Equipment Purchases

Costs in this category should be provided at the level of detail reflected in the following example:

units	type	cost	total
4	Pulse Height Analyzer	$4,399	$17,596

D. Indirect Costs

Indirect costs should be explained to an extent that will allow the Government to understand the basis for the estimate. Examples of prior year historical rates, current variances from those rates, or an explanation of other basis of estimates should be included.

Where costs are based on allocation percentages or dollar rates, an explanation of rate and application base relationships should be given. For example, the base to which the General and Administrative (G&A) rate is applied should be explained as: application base equals total costs before G&A less subcontracts.

E. Other Costs

Other applicable cost categories include purchase of expendable materials, computer services, communications costs, and publication expenses. The appropriate level of detail should be provided in each case.

ADDITIONAL INFORMATION REGARDING PROPOSAL SUBMISSION, EVALUATION, SELECTION, AND IMPLEMENTATION

The information contained in Appendix D augments/supersedes Appendix B and is applicable only to NRA 90-OSSA-14.

I. PROPOSAL PREPARATION AND SUBMISSION

A. Letter of Intent to Propose

To facilitate planning for the proposal evaluation process and the timely selection of a scientific peer review panel, it will be useful if prospective investigators intending to submit proposals for participation in this program will notify NASA by May 31, 1990. A one-page letter of intent containing the name and affiliation of the Principal Investigator and all Co-Investigators, should be sent to Dr. Lawrence Caroff, Astrophysics Division, Code SZF, National Aeronautics and Space Administration, Washington, DC 20546. The letter should summarize the primary research areas and objectives of the proposed investigation.

B. Proposal Preparation Procedures

A uniform proposal format is recommended to aid in proposal evaluation. All proposals should contain a scientific and technical description of the investigation and a cost plan. As past performance under this program is one of the selection criteria, investigators presently supported under this program should include a discussion of their past grant-related accomplishments. In addition, proposers should include a complete listing of awarded or pending research funding support from NASA and other Government agencies. Proposals will be restricted in length to 20 single-spaced typewritten pages of text or less. General guidelines concerning the basic proposal content and format may be found in Appendix B. See Appendix C for information regarding the level of detail requested by the NASA Office of Procurement relative to the proposed cost plan.

C. Proposal Submission Information

Twenty copies of each proposal should be submitted to the following address no later than July 17, 1990:

Infrared Submillimeter and Radio Astronomy R&A Program
Code SZF-10
National Aeronautics and Space Administration
Washington, DC 20546

II. PROPOSAL SELECTION

A. Evaluation and Selection Procedures

The scientific and technical merits of proposals will be evaluated by a scientific peer review panel. The highest rated proposals will then be considered in the context of the overall funding availability and programmatic needs. Final selection will be made by the Director, Astrophysics Division, Office of Space Science and Application.

B. Evaluation Criteria

The following specific proposal-related evaluation criteria, listed in descending order of importance, will be used in evaluating proposals for investigations within the Infrared, Submillimeter, and Radio Astronomy R&A Program **(note these criteria supersede those cited in Appendix B)**:

1. The overall scientific and technical merit of the investigation.

2. The relevance of the proposed research to NASA's ISR Astronomy program.

3. The technical feasibility of accomplishing the stated scientific goals (e.g., the suitability of the proposed technical approach or analysis techniques).

4. The probability of success of the proposed research.

5. The competence and relevant experience of the principal investigator and any collaborators as an indication of their ability to carry the investigation to a successful conclusion within the requested resources, including timely publication of peer-reviewed journal articles. Past performance of the investigators relevant to work conducted under previous NASA ISR Astronomy grants, if applicable, will be considered.

6. The reputation and interest of the investigator's institution as measured by the willingness of the institution to provide the necessary support to ensure the investigation can be completed satisfactorily.

7. Overall standing among similar proposals available for evaluation and/or evaluation against the known state of the art.

In addition to the preceding criteria, cost and management factors will be separately considered in all selections. Note, NASA may desire to select only a portion of a proposer's investigation, in which case the investigator will be given the opportunity to accept or decline such partial acceptance.

C. Implementation

Individuals responding to this Announcement will be notified of the outcome of the proposal selection process by the Chief, Infrared and Radio, Astrophysics Branch. It is currently expected official notifications of acceptance or rejection will be made in September 1990, at which time, in the case of those investigations recommended for selection, discussions of the specific terms under which the investigation will be implemented will be initiated.

III. SCHEDULE

It is currently planned to solicit and review proposals for participation in the Infrared, Submillimeter, and Radio Astronomy R&A program approximately every three years. Proposals received by July 17, 1990, will be evaluated in the present review. Notification

of the review results is planned for September 1990. The schedule of planned activities for the present review cycle of the Infrared, Submillimeter, and Radio Astronomy R&A program is shown below.

Letters of Intent due	May 31, 1990
Last date for inclusion of proposals in 1990 review	July 17, 1990
Peer Review	August 1990
Proposal Selections	September 1990
Initiation of Funding	October 1990

While the above plan represents NASA's intent, it should be realized that future circumstances and events could result in modifications of this schedule.

TABLE 1: INFRARED, SUBMILLIMETER, AND RADIO ASTRONOMY FLIGHT PROGRAMS

PROGRAM	PRIMARY FUNCTION
Balloon Science	Ongoing multipurpose short lead-time observations
Kuiper Airborne Observatory (KAO)	Ongoing multipurpose short lead-time observations
Infrared Astronomical Satellite (I) (IRAS)	First all-sky infrared survey
Cosmic Background Explorer (COBE)	Large scale structure and spectral properties of the cosmic background radiation
Infrared Telescope in Space (I) (IRTS)	2-4 week background survey with small, cooled IR telescope (cooperative mission with Japan)
Stratospheric Observatory for Infrared Astronomy (I)* (SOFIA)	Multipurpose high spectral and spatial resolution short lead time measurements
Space Infrared Telescope Facility* (SIRTF)	Exceptionally high sensitivity orbiting great observatory
Near Infrared Camera and Multi-object Spectrometer (NICMOS)	High spatial resolution 1-2.5 μm measurements using the Hubble Space Telescope

TABLE 1: INFRARED, SUBMILLIMETER, AND RADIO ASTRONOMY FLIGHT PROGRAMS (Continued)

PROGRAM	PRIMARY FUNCTION
Orbiting Very Long Baseline Interferometry (I)* (OVLBI)	Increased spatial resolution for radio astronomy (cooperative missions with Japan-VSOP-and with USSR-Radioastron)
Submillimeter Moderate Mission* (SMMM)	Spectral line survey in (approximately 100-1000 micron regime at high spectral/spatial resolution
Large Deployable Reflector* (LDR)	Exceptionally high spatial/spectral resolution for submillimeter/far infrared observations
Submillimeter Wave Astronomy Satellite (SWAS)	Initial measurements from space of H_2O, O_2, CI in the Milky Way

*Tentative missions pending authorization to proceed.

(I) International Collaboration

TABLE 2: CURRENT RESEARCH TASKS SUPPORTED UNDER THE INFRARED, SUBMILLIMETER, AND RADIO ASTRONOMY R&A PROGRAM (CATEGORY A)

PROGRAM ELEMENT	CONTENT
DETECTORS AND TECHNOLOGY	• Extrinsic photoconductor materials and arrays (close coordination with SIRTF requirements) • Very low temperature bolometer and bolometer array development • Submillimeter heterodyne systems • Characterization of NICMOS HgCdTe arrays • Development of near and mid-IR array cameras
BALLOON SCIENCE	• Anisotropy and spectrum of cosmic background radiation • Submillimeter observations of discrete sources • Study of lightweight panels for use in far-IR/Submillimeter telescopes
GROUND-BASED ASTRONOMY	• Observations of circumstellar shells • Use of NASA deep space network for astronomy, including molecular spectroscopy and interferometry

* U.S. GOVERNMENT PRINTING OFFICE: 1990-261-276:20016

NASA Mailing List Update

This is the update form for the NASA Office of Space Science and Applications Scientific Investigation mailing list. If applicable, please fill out all the following information, refold the questionnaire, tape it, and mail it back to the preprinted address on the reverse side.

Please check the type of NASA Mailings you would like to receive (check all that apply):

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- ☐ 2. International
- ☐ 3. Minority Business
- ☐ 4. NASA Center
- ☐ 5. Nonprofit Corporation
- ☐ 6. Other Government Agency
- ☐ 7. Private Industry
- ☐ 8. Small Business

Discipline (check all that apply)

- ☐ 1. Astronomy
- ☐ 2. Communications
- ☐ 3. Computer Sciences/ Information Systems
- ☐ 4. Environmental Observations
- ☐ 5. Life Sciences
- ☐ 6. Microgravity Sciences
- ☐ 7. Planetary Sciences
- ☐ 8. Solar and Space Physics

Program Involvement (check all that apply)

- ☐ 1. Principal Investigator
- ☐ 2. Co-Investigator
- ☐ 3. Management/Administration
- ☐ 4. General Interest
- ☐ 5. Flight Project
- ☐ 6. Suborbital Investigation
- ☐ 7. Data Analysis
- ☐ 8. Basic Research
- ☐ 9. Advanced Planning and Mission Definition
- ☐ 10. Science Working Group
- ☐ 11. American Astronomical Society Member

OSSA Involvement (check all that apply)

- ☐ 1. Astrophysics
- ☐ 2. Communications and Information Systems
- ☐ 3. Earth Science and Applications
- ☐ 4. Life Sciences
- ☐ 5. Microgravity Science and Applications
- ☐ 6. Shuttle Payload Engineering
- ☐ 7. Solar System Exploration
- ☐ 8. Space Physics
- ☐ 9. None

NASA Contractor/Grantee: ☐ Yes ☐ No
(If YES, please provide current NASA/OSSA Contract & Grant Numbers and Designate Level of Responsibility)
(P)–Principal Investigator (C)–Co-Investigator (L)–Team Leader

Example
NAGW-12345 P

Signature: _____ Date: _____

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Washington, D.C.
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